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Environmental Regulation in the Philippines and Utilizing Environmental Education as Alternative Enforcement Instrument

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Abstract

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Our environment is facing a crucial global problem relating to the degradation of the natural resources and to the profound increase of air, water, solid wastes and hazardous wastes pollution. Industrial revolution, scientific advancement and technological innovations dramatically changed every aspect of human living's condition, however it marked a major turning point in Earth's ecology and humanity's relationship to the environment. The quality of our environment had been compromised with the depletion of the natural resources and hinders the mankind from enjoying the Earth's natural resources, fresh water, pristine air and unpolluted environment.

We all have witnessed the atrocious revenge of nature with the numerous calamities all around the world and study showed that one factors of these catastrophic events are human activities that caused environmental destruction.

Moreover, the issue of Climate Change is affecting every country and every continent in the world. Weather patterns change drastically, sea levels are rising, polar ice caps are melting and human race will not able to survive the heat of this planet if this devastating phenomenon will not be prevented and mitigated.

Prevention of further environmental degradation demands for an increasing need for the public to partake on environment-related problems, to use their critical thinking and get involved on the decision-making process on matters that significantly affect our well-being and the protection of our environment.

This paper established the correlation between environmental education on how it can be utilized as an alternative enforcement tool and environmental regulation compliance towards effective governance in the Philippines. It was then proved that by promoting a holistic eco-consciousness approach through diffusing information and empowering the selected respondents with strategic programs and applications, enforcement of regulations will be achieved towards a quality human welfare and sustainable ecosystem. The participation of every citizen complements existent legal instruments which are facing shortage of institutional capabilities of enforcement. Thus, increased participation of the public through environmental education reinforced legal frameworks to be more respected and augment its implementation.

Keywords : Environmental Regulation, Environmental Education, Climate Change, holistic eco-consciousness, sustainable ecosystem

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Dedication

Grateful and honoured to be one of the Alumnae of this prestigious University which made possible by my sponsor ***Korean Electric Power Company (KEPCO)*** *and my great academic adviser,* ***Professor Huck-ju Kwon.***

To my ever-supporting mentor and Director of DENR-EMB4A, ***Noemi Paranada****, who always reminds me to pray, my personal life journey will not be so easy without your shared wisdom and sisterly love.*

For the guidance, love and support of my mother, ***Gloria de los Reyes*** *and my late father,* ***Santiago de los Reyes****, who was more excited then when I was informed of this scholarship grant. This is for you..*

I thank my ***God Almighty****, for giving me strength to survive life in Korea for 17 months, as I always endure the pain of being away with my two adorable sons, worrying on how life will treat them without their mother. But all the sacrifices were paid off knowing they became more matured and learned how to live independently. This is only one of my endeavors which made me surpassed all the hardships because I am thinking this is all for them and for their brighter future. And one day in their lives, they will be reminded of my unconditional and undying love for them.*

Abdul Azis Deron and Al-Rashjid Deron*. I am the proudest and luckiest mother to have you both in my life. I dedicate this for both of you.*

List of Abbreviations

CA	Commonwealth Act
CC	Climate Change
CCO	Chemical Control Order
CDM	Clean Development Mechanism
CHED	Commission on Higher Education
DAO	Department Administrative Order
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DESD	Decade for Education for Sustainable Development
DOST	Department of Science and Technology
DSWD	Department of Social Welfare Development
EE	Environmental Education
EMB	Environmental Management Bureau
EO	Executive Order
ER	Environmental Regulation
ESD	Education for Sustainable Development
LGC	Local Government Code
LGU	Local Government Units
LLDA	Laguna Lake Development Authority
NCCAP	National Climate Change Action Plan
NEPC	National Environmental Protection Council

NGO	Non-Governmental Organizations
NWAPCC	National Water and Air Pollution Control Commission
PCO	Pollution Control Officer
PD	Presidential Decree
PEC	Philippine Environment Code
PEISS	Philippines Environmental Impact Statement System
PEP	Philippine Environmental Policy
RA	Republic Act
SDG	Sustainable Development Goals
TESDA	Technical Education and Skills Development Authority
UNCED	United Nation Conference on Environment and Development

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Chapter 1. Introduction

1.1. Study Background

Environmental regulation in the Philippines has been legislated more than a century ago but the enforcement of it has been a burgeoning issue since then. The legislative body of the government enact the laws and set the standards for its implementation, however it all become futile if it is not strictly and effectively enforced. Environmental regulation is essential in the management of our environment as it is intertwined with the well-being of the public. Needless to say, the unsustainable practice of mankind towards the production and consumption of goods and the ways how we use, store and dispose it will result to adverse environmental impact and public health hazards.

Enforcement of these environmental regulation requires stringent process before shaping the mindset of the people and change their perception on the destruction into protection of our environment. Regulatory agencies in the Philippines even with strong hands, still need an extended arm in the private sectors, local governments and community leaders in order to change their attitudes, their practices and beliefs on environmental protection.

This research anticipates that Pollution Control Officers (PCO)s, Managing Heads (MH)s of private companies and Local Government Units (LGU)s representatives are still lack of understanding, knowledge, skills and expertise on

environmental regulation necessity to effectively comply on the provisions of the laws resulting in the occurrences of breaches of compliances or violations on environmental related matters. Environmental education is used to strengthen their environmental awareness, influence their behaviors and increase their drive, skill, ability and participation to preserve, protect and conserve natural resource and environment.

Environmental education is the educational process emphasizing physical environment and social environment knowledge both abstract and concrete to initiate the changes and affectations to human beings for establishing attitude, behavior, and values to conserve or develop the environmental quality, individual and people's quality living. (Weerawatananon, 1989).

Education for sustainable development Scholars argue that 'environmental education about the environment' as enshrined in Tbilissi Declaration has adequately captured the essence of contemporary sustainability concept. Herein sustainability education is viewed as a progressive transition from the earlier focus of Environmental Education (Stevenson 2006). According to Sauvé (1996) sustainability education principles such as holism, systems thinking, inter-disciplinarily, values reflection and integration, critical thinking, issue-based and action learning are not foreign to the Environmental Education educational approach. Moreover, in 2002, a new sense of urgency was given by the United Nations' initiative, the Decade for Education for Sustainable Development (DESD). The rise of planetary thinking or 'planetism' (Ellyard

2008) calls for a new pedagogy of learning and teaching, one that requires strategic intervention at the highest level of education policy and decision-making. Oft-used catchphrase such as 'transforming' higher education for a sustainable society' reflects this ambition.

Philippines is one of the countries in the world that is most vulnerable to natural disasters such as earthquake and volcanic eruptions due to its geographical location that lies in the "Pacific Ring of Fire". Moreover, the country is heavily composed of large bodies of water and faces the Pacific Ocean which makes it consistently at risk from severe natural hazards such as typhoons, floods and landslides.

For the past few years, the country has been ultimately devastated by strong typhoons which triggered major storm surges leaving record-breaking casualties in the Philippine history. And on account of natural disasters which involved loss of lives and property, the public has an eventual high anxiety and apprehension on the current state of the environment. Apparently, most of the times, the occurrence of these unfortunate events was being attributed to the neglect of duties of the public officials in the government who were tasked for preserving the quality of the environment. The enforcement of regulation on environmental protection was always linked to these events as well as the corruption issues in the administration. However, none of these indictments will help revert the environmental damages caused by the natural disasters but cautious action will somehow prevent the occurrence of these catastrophic events.

1.2. Purpose of the Research

Regulation and enforcement are inter-related but two distinct things and challenges confronting it does not only apply on environmental regulation but also in other settings such as Penal law, Family law, Organization Rules, Health and Safety regulations, among others. Law is a crucial tool to organize social to be integrity, both government organizations in the roles of regulatory body and private sectors including people and other private organizations who are assigned by law for being regulatory body and legal practices agency (Kruengarm, 1987; Pollakul, 1988; Saenguthai, 1995; Chansomboon, 1990; Mullikamarn, 1999). It therefore defines the structure as norm and social behaviors. However, if there are breaches of compliance from the provisions of the law, there should be a connection or middle tool between regulation and compliance in order to enforce it. Information dissemination on the proper procedures should be given in order to correct the violations and eliminate the causes of committing it.

"Ignorantia legit neminem excusat" is a famous latin maxim which means "Ignorance of the law excuses no one from compliance therewith". No one is exempted from following the provisions of the laws of the land but how to be able one from complying according to the proper procedures has always been challenging. Defiance and non-compliance are difficult not only on the part of the regulatory agencies of the government but on the part of the stakeholders who are the direct beneficiaries or affected on the outcome of compliance or deterrence to environmental regulations.

The objective of this paper is to determine if environmental education can contribute to the decision making and critical thinking of the selected respondents in this study to resolve issues on environmental regulation compliance and how can it be utilized as an alternative enforcement tool towards effective environmental governance in the Philippines. As this paper examined the environmental regulation enforcement in the Philippines, the need to conduct environmental education or awareness assessment focused on the representatives of the public and private companies called Pollution Control Officers (PCO) and Managing Heads (MH) who handles all the environmental concerns and selected representatives of the Local Government Units (LGU).

Moreover, the existing policies on environmental protection have been revisited and the extent of the participation of these authorized personnel in every institution which have the dramatical contribution to the outgrowing pollution concerns of the country.

Accordingly, it enabled the determination on what aspects need to be strengthened so that everyone can effectively comply with the current Environmental regulations and overall environmental management practices in the Philippines, to propose a new policy design that will make compliance to the laws more encouraging, not just by giving sanctions to those who will fail to comply rather than providing rewards for compliant. Furthermore, the existing approaches on environmental protection such as the greening strategy of the country to mitigate climate change, strengthening renewable energy,

promoting clean and green technology among the business sectors and capacitating Local Government Units to enact local laws that will promote healthy, clean and green lifestyle among the communities and students will be examined for further recommendations.

In dealing with Environmental regulation, this paper highlighted the salient features of the six major Environmental Laws that the general public should be knowledgably equipped and the significant roles of the various government agencies in the implementation of Environmental regulations at national and local level approaches towards achieving environmental sustainability while attaining economic development.

Reversing environmental degradation is a long process that requires stringent participation of each and every individual to have a conscious action toward saving our environment.

A single act can influence others to start saving the Earth as we all share one environment, whatever we do can have an effect to others. Strong participation and perseverance to solve this issue will have a life-long effect for our present well-being and the future generations.

There are a lot of things we need to know about the problems in our environment, but the most important thing is that we should know our vital roles to change the quality of our environment now, today and not tomorrow, as responsible stewards of the greatest creation that God has given to mankind, the Earth.

Chapter II. History and Background Information

2.1. The Philippine Archipelagic Characteristics

The Philippines is an archipelago situated in the south eastern portion of Asia with an estimated land area of 300,000 square kilometers. It is composed of 7,107 islands, 2,000 of them are named and only about 1,000 of those islands are populated. Twenty islands make up the 96% of the Philippines land area. The islands range from the largest of 141,395 square kilometers (Luzon) and 101,999 square kilometers (Mindanao) and Visayan islands which represent the three principal regions of the archipelago. Only about 470 islands have areas bigger than 1.6 kilometers. Because of its central location in the Far East, the country has been tagged as the "Crossroads of the Pacific".

Philippines is one of the largest island groups in the world and has the largest discontinuous coastline in the world with 36,289 km. It is said to be twice longer in length than the coastline of the United States and Greece. There are 212 Million hectares of marine waters within its territorial jurisdiction. Two-thirds of the country's more than 1,500 municipalities are located along the coast. Seventeen of its more than 65 cities are in coastal areas. 2019 population is 108 Million and more than 60 percent of the population live in the coastal areas.

The location of the Philippines if we locate on the globe, is near the equator, and the reason why it has a tropical marine climate dominated by rainy or wet

season and dry season. The country experiences heavy rains during months of June to October and cooler and drier are from December to February. Temperature ranges from 24° C to 26° C, however it rises above 35° C during months of March to May.

The archipelagic nature of the country, together with its river systems and 59 lakes, makes it vulnerable to pollution of the marine environment by dumping as well as to pollution from land-based sources. Easily transmitted across the seas, organic wastes are reported to constitute 55-75 percent of pollution affecting the major areas of water in the Philippines. Based on reports of the Department of Environment and Natural Resources (DENR) since 1980, wastes from sewage, garbage, poultries, piggeries, refineries, mine tailings, and toxic substances, have caused the death of rivers, including all the rivers in Metropolitan Manila, as combined with siltation. Largely caused by soil erosion, siltation of the country's waters is estimated to be at the rate of 60 million tons a year. Loss of forest cover and degraded watershed precipitate soil erosion which throws topsoil into the sea at a rate of 100,000 hectares a year. Industrial wastes dumped into the sea and carried across the islands are considerable.

The country's coastal zone, which provides the people food security primarily through fisheries production, is also the location of residential districts, tourism sites, chemical plants, food processing facilities, and shipping infrastructures,

thus presenting problems in management of environmental protection in correlation with the demands of economic development.

This predicament is exemplified by the mining industry. Side by side with its contribution to the economy, it results in serious degradation of the environment. Tremendous amount of mine wastes and tailings are generated by mineral extraction, which are carried to rivers and into the seas. The environmental impact of the mining industry may be a cause of increasing concern as the new Mining Code provides impetus for its productive potential. It is the archipelagic character of the Philippines that complicates the problems of governance for environmental protection, as centralized in the Metropolitan Manila. Administrative effectiveness in the implementation of environmental laws is weakened by the division of the country into islands vis-à-vis the inadequacies in the means of transportation and communication.

In the long view, on account of the archipelagic character of the Philippines, the global greenhouse effect and the deterioration of the earth's ozone layer may have disastrous consequences. Human settlements and key sectors of civil and political life along the coastal stretch of the country would be seriously affected by the rise of ocean levels as a consequence of the thermal expansion of the sea.

2.2. Environmental Regulation in the Philippines

Environmental regulation in the Philippines was first introduced during the time when the country was placed under Spanish Colonial Regime (1565-1898). The Spanish Law of Water of 1866 was adapted and the application was extended in the Philippines although it was promulgated in Spain. This law authorizes the Spanish Governor General to order suspension of operation of industries contaminating water resources or bodies of water. Promulgation of environmental regulation were continued when Philippines was ceded to the United States during the American Regime (1898-1946) such as the Irrigation Act of 1912 or Act 2152 which provided a system for the appropriation of public waters and water quality management; Act 2812 which prohibit the cutting or utilization of fruit trees and bushes in the public or communal forests; Act 3992 which regulated disagreeable sound, noise, odor or smoke from motor vehicles and Act 3983 which provided for the protection of wild flowers and plants in the Philippine Islands and prescribed conditions under which they may be collected, kept, sold and exported.

Commonwealth Act No. 383 was likewise enacted during the Commonwealth period of the US colonial administration, which punished dumping of waste matter into any river, C.A. No. 141 which provided a system for disposing and conserving public lands and C.A. No. 137 which was enacted for the conservation and development of mineral lands.

After World War II when the country gained political independence, major policies on environmental protection and control of industrial pollution were enacted such Republic Act No. 3931 which established the National Water and Air Pollution Control Commission in 1964. The Reforestation Commission was created under Republic Act 2706 relative to the spreading problem of deforestation and Republic Act No. 5752 which established the city forests, tree parks and watersheds. Moreover, the Laguna Lake Development Authority was created as a legislative response to the emergent pollution of the Laguna Lake which extremely affected the lake waters and the lake basin ecology.

One of the major significant policy promulgated in 1977 was the Presidential Decree No. 1151 otherwise known as the Philippine Environmental Policy which provided an intensive, integrated program of an environmental protection that will bring about a concerted effort towards the protection of the entire spectrum of the environment through a requirement of environmental impact assessments and statements. It was followed with the promulgation of Presidential Decree No. 1586 on June 11, 1978 otherwise known as the Philippine Environmental Impact Statement System which required private corporations or government institutions to prepare an Environmental Impact Statement (EIS) for every proposed project or undertaking prior operation of its facilities to reconcile socio-economic undertakings and environmental quality.

On the same day, Presidential Decree No. 151 known as the Philippine Environment Code was issued which provided basic standards and programs in the management of air quality, water quality, land use, natural resources and wastes. On April 18, 1977 Presidential Decree No. 1121 was enacted creating the National Environmental Protection Council mandated to implement the Code and intended to achieve coherence in the activities of government agencies relating to environmental protection, to propose new policies and laws on account of changes in the environment status of the country and to review impact assessment of government projects.

When the country was placed under martial-law period between 1975 and 1977, more laws on environmental protection were enacted which included the Code of Sanitation, the Water Code, the Fisheries Decree, the Marine Pollution Decree, and the Coral Resources Development and Conservation Decree. This period also saw the promulgation of Presidential Decree No. 1181 providing for a systematized legal regulation for the prevention, control, and abatement of air pollution from motor vehicle. Presaging the Local Government Code of 1991, Presidential Decree No. 1160 granted authority to heads of barangays (villages) to enforce pollution and other environmental control laws. Presidential Decree No. 1121 was also created during this period which pronounced the government's awareness of the continuing deterioration of the Philippine environment cause by rapid urbanization, industrial growth, population expansion, natural resources extractions, and the use of modern technology.

The post-martial-law Aquino administration reorganized the government and transformed the old administrative structure. The Department of Environment and Natural Resources (DENR) was created under Executive Order No. 192 which was mandated to protect, restore and enhance the environmental quality towards good public health, environmental integrity and economic viability. Moreover, Republic Act No. 6969 was then enacted in 1989 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act, an act which provided a comprehensive framework to control and manage the importation, manufacture, processing, distribution, use, treatment and disposal of toxic substances and hazardous and nuclear wastes. The DENR issued a Chemical Control Order (CCO) in order to limit, prohibit, control and regulate the use, manufacture, import, export, transport, processing and storage of priority chemicals because of the serious risks it pose to public health and environment. Republic Act 7586 or the National Integrated Protected Areas System was established in 1992 and placed under the administration of DENR to manage and protect rare and endangered species of plants and animals, biographic zones and related ecosystems, whether terrestrial, wetland or marine.

The Philippines began to address a global issue of climate change in 1991 and formulated the Philippine Strategy for Sustainable Development. The country officially adopted the Philippine Agenda 21 which serves as the nation's blueprint for sustainable development. Further, the Philippines also adopted the Clean Development Mechanism in adherence to Kyoto Protocol.

The Philippine government advanced in passing and enacting national measures towards environmental protection and preservation and gave birth to major legislations such as R.A. 8749 or the Clean Air Act of 1999 which provided a comprehensive air quality management policy and program, R.A. 9003 or the Philippine Ecological Solid Waste Management Act of 2000 which provide a legal framework for the country's systematic, comprehensive and ecological solid waste management program and R.A. 9275 or the Philippine Clean Water Act of 2004 which aimed to protect the country's water bodies from land-based pollution sources and to prevent pollution through a multi-sectoral and participatory approach.

In order to increase awareness on environmental protection, R.A. 9512 or the Environmental Awareness and Education Act of 2008 was enacted which required integration of Environmental Education in the school curricula at all levels, public or private, from daycare to vocational even out-of-school youth courses or programs.

The country further enacted R.A. 9729 or the Climate Change Act of 2009, which aims to systematically integrate the concept of climate change into government policy formulations and development programs and creating for this purpose the Philippines Climate Change Commission (PCCC).

2.3. Environmental Regulation Governance

The Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) is the lead agency to oversee the policies implementation and enforcement of environmental laws in the Philippines. It is in the organizational objective to properly manage and protect the environment to attain sustainable development while recognizing and mobilizing the responsibility of various stakeholders including the local government units, other government agencies, private and business organizations, people's organizations and civil society organizations in addressing environmental problems.

Moreover, "it is the prime duty of the organization to establish and enforce environmental quality standards such as the quality standards for water, air, land and noise for the protection and sustainable use of natural resources consistent with the national environmental goals, other applicable environment and natural resources laws and international conventions." (DAO 2014-01)

To be able to attain the country and organization's goal, it is imperative that massive information dissemination is conducted to capacitate stakeholders, civil society organizations, public and private institutions, local government units and the citizenry towards proactive participation in environmental management and protection programs and activities and ensuring strict compliance with the six substantive environmental laws, to wit:

1. Presidential Decree 1586 “Philippine Environmental Impact Assessment System” - The Environment Impact Assessment System was formally established in 1978 with the enactment of Presidential Decree no. 1586 to facilitate the attainment and maintenance of rational and orderly balance between socio-economic development and environmental protection. EIA is a planning and management tool that will help government, decision makers, the proponents and the affected community address the negative consequences or risks on the environment. The process assures implementation of environment-friendly projects.

2. Republic Act 6969 – “Toxic Substances and Hazardous Wastes Control and Nuclear Waste Control Act” - The law aims to regulate restrict or prohibit the importation, manufacture, processing, sale, distribution, use and disposal of chemical substances and mixtures the present unreasonable risk to human health. It likewise prohibits the entry, even in transit, of hazardous and nuclear wastes and their disposal into the Philippine territorial limits for whatever purpose; and to provide advancement and facilitate research and studies on toxic chemicals.

3. Republic Act 8749 – Philippine Clean Air Act of 1999 The law aims to achieve and maintain clean air that meets the National Air Quality guideline values for criteria pollutants, throughout the Philippines, while minimizing the possible associated impacts to the economy.

4. Republic Act 9003 “Ecological Solid Waste Management Act of 2000” - In partnership with stakeholders, the law aims to adopt a systematic, comprehensive and ecological solid waste management program that shall ensure the protection of public health and environment. The law ensures proper segregation, collection, storage, treatment and disposal of solid waste through the formulation and adaptation of best eco-waste products.

5. Republic Act 9275 “Philippine Clean Water Act of 2004” - The law aims to protect the country's water bodies from pollution from land-based sources (industries and commercial establishments, agriculture and community/household activities). It provides for comprehensive and integrated strategy to prevent and minimize pollution through a multi-sectoral and participatory approach involving all the stakeholders.

6. Republic Act 9512 “National Environmental Awareness and Education Act of 2008” – It mandates the integration of environmental education in school curricula at all levels, whether public or private. It provides that environmental education shall encompass environmental concepts and principles, environmental laws, the state of international and local environment, local environmental best practices, the threats of environmental degradation and impact on human well-being, the responsibility of the citizenry to the environment and the value of conservation, protection and rehabilitation of natural resources and the environment in the context of sustainable development.

Further, the organization is mandated also to support the implementation of Republic Act 9729 - the Climate Change Act of 2009 and the National Climate Change Action Plan (NCCAP). “This act calls to integrate the concept of climate change in various phases of policy formulation, development plans, poverty reduction strategies, and other government development tools and techniques. This is to ensure that government plans and actions are founded upon sound environmental considerations and sustainable development principles. Aside from that, the government shall take into consideration gender-sensitive, pro-children, and pro-poor perspective as an input to its climate change efforts, plans, and programs.

Likewise, the government shall encourage the participation of the national and local government, businesses, non-government organizations (NGOs), and local communities and public to mitigate the adverse effects of climate change. This is to align initiatives on climate change into a collective approach (e.g. the disaster and risk reduction measures integrated to climate change programs and initiatives).” (ap.fftc.agnet.org., Climate Change Act)

2.4. Existing Policy in the Philippines

Republic Act No. 9512 otherwise known as the “National Environmental Awareness and Education Act of 2008” Pursuant to Section 3. Scope of Environmental Education “The Department of Education (DepEd), the Commission on Higher Education (CHED), the Technical Education and Skills

Development Authority (TESDA), the Department of Social Welfare and Development (DSWD), in coordination with the Department of Environment and Natural Resources (DENR), the Department of Science and Technology (DOST) and other relevant agencies, shall integrate environmental education in its school curricula at all levels, whether public or private, including in barangay daycare, preschool, non-formal, technical vocational, professional level, indigenous learning and out-of-school youth courses or programs. Environmental education shall encompass environmental concepts and principles, environmental laws, the state of international and local environment, local environmental best practices, the threats of environmental degradation and its impact on human well-being, the responsibility of the citizenry to the environment and the value of conservation, protection and rehabilitation of natural resources and the environment in the context of sustainable development."

This Act provides for the promotion of environmental awareness through environmental education which shall encompass environmental concepts and principles, environmental laws, the state of international and local environment, local environmental best practices, the threats of environmental degradation and its impact on human well-being, the responsibility of the citizenry to the environment and the value of conservation, protection and rehabilitation of natural resources and the environment. The principal target of implementation are the educational institutions as part of recognition of the role of the youths in nation building and hope of the future generations. This act gives importance

on educating the children at early age to be mindful on environmental-related issues and their vital roles to be part of the resolution to achieve the national goal of sustainable development.

The above-mentioned concerned government agencies have been doing their contributions in the implementation of this Act, initiated different programs and activities to encourage participation of the students and educational institutions and continuous promoting massive environmental awareness campaign to different private institutions, communities and officials in the local government. Although this Act enhances the right of every citizen to be aware on the status of the environment, it did not specifically mandated private manufacturing companies which were considered as the primary source of pollutions in the country. Continuing environmental education is emphasized on students and schools' curicula but it also needs to be required in private manufacturing companies, industries and projects of local governments who have or might have adverse impacts to the environment. It is noteworthy to say that a regulation could be as useless as a piece of document if it is not enforced. The state have ways and means to impose this law and mandated the concerned agencies to regulate compliance of the stakeholders but it is always the natural tendency of human being of not complying unless there are already clear consequences of their non-compliance. They would sometimes balance the costs of compliance rather than the penalties they expect to be imposed, and in the end they chose to evade compliance as long as they can until it will be discovered and just be ready for the sanctions. "Violate now and deal with the

penalties later" saying is but a very risky move to some companies but somehow they cannot be blamed for sometimes for the costs of securing permits from the agencies and the tedious procedures they have to go through before the permits be released is already a burden. That is why their worst last resort is to continue their project operations while no one reports or knows their non compliance then little by little try to undergo the compliance process with the concerned government agencies.

In this kind of agenda setting, information dissemination is very material tool to be able to strengthen the awareness and knowledge of these companies to know their responsibility and their compliance is much more important than the income they will gain from such businesses. They should be informed that health of every human being is much more essential next to the quality of the environment and profits gained from business. We can ensure good health if our environment is clean, and we would not waste money for medical bills and medications if everybody is healthy.

Moreover, this act shall cover both theoretical and practicum modules comprising activities, projects, programs including, but not limited to, tree planting; waste minimization, segregation, recycling and composting; freshwater and marine conservation; forest management and conservation; relevant livelihood opportunities and economic benefits and other such programs and undertakings to aid the implementation of the different environmental protection law.

Chapter III. Theoretical Framework

3.1. Theoretical Discussion

The Government is the primary actor in safeguarding the sources of every human being rights including the environment and the right of the people to a balance and healthful ecology not only to ensure that government services will be delivered fairly for the general public interests. Moreover, the Philippine Constitutional itself identified environment and natural resources as one of the major rights of the citizens that need to be addressed by the Government.

It is noteworthy to mention one of the landmark cases in Philippine jurisprudence, Oposa v. Factoran, promulgated on 30 July 1993 by the Supreme Court. 44 children though their parents invoked their right to a healthful and balanced ecology and the protection of the State in its capacity as *parens patriae*. The Court granted the petition and ruled that the children has a legal standing to come to court "to sue in behalf of succeeding generations ... based on the concept of intergenerational responsibility." Their right to a healthy environment carried with it the obligation to preserve the environment for the succeeding generations. Opening the eyes of these children at young age on environment related concerns is very vital as well as to stand on their rights and the future generation. Making people feel that they have the right to affect a decision modifies their behavior in a positive way, mostly because then they are given the chance for a say. In this way, later conflicts ad hostilities induced

because of decisions made without their contribution are avoided (Vanclay, 1996)

The 1987 Constitution of the Republic of the Philippines, “Sec. 16, Article II under the Declaration of Principles and State, stipulates that The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature; Article XII under the National Economy and Patrimony states that among the goals of the national economy is sustained productivity and equitable distribution of the nation’s resources and finally under Article XIII on Social Justice and Human Rights stressed the promotion of social justice through regulation by the state of ownership and use of state properties, which includes natural resources.”

The first appearance of the concept of Environmental Education was at UN Conference on Environment and Development in Rio de Janeiro in 1992 and the well-known Agenda 21 announced that “the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries, which is a matter of grave concern, aggravating poverty and imbalances” (UNCED 1993: 8). It was at this Earth Summit in Rio that the significance of the current unsustainable patterns of consumption and production and the resulting harm to the global environment these patterns result in were first addressed at the international level. Thus, the consumption and production patterns of modern societies are recognized as one of the main issues that must be addressed to

tackle the current patterns of unsustainable growth and development. Sustainable consumption requires dealing with not only what we consume, but also the ways in which we consume, how much is consumed, and how we deal with the wastes from our consumption.

Education for Sustainable Development (ESD) also has its roots in the UN Conference on Environment and Development and educational objectives for sustainable development were detailed in Chapter 36 of Agenda 21 in 1992. Similarly to SCP, ESD was advanced as an important social process at the WSSD in 2002 during which the proposal for the UN Decade of Education for Sustainable Development (2005-2014) (DESD) was first made. The UN DESD was initiated with UNESCO as the lead organization and they published Astrolabe: A Guide to ESD Coordination in Asia and the Pacific (2011) which summarizes the essence of ESD as noted: It aims to contribute to sustainable development by empowering people, through education, to assume responsibility for creating a sustainable future. It seeks to engage people from all walks of life, worldwide, in bringing about changes for a better world.

Stakeholders from across sectors have a role to play in changing the way we deliver education and ensuring we make appropriate decisions for a better future. Environmental Sustainability development allows people to not only use their interpretation on environment, society and economics but also to equip them with ability to position themselves, evaluate their surroundings and to

conduct their lives in ways that are consistent with sustainability (UNESCO 2011: 1-3).

Environmental Education focuses on engaging with citizens of all demographics to think critically, ethically, and creatively when evaluating environmental issues, make educated judgments about those environmental issues, develop skills and a commitment to act independently and collectively to sustain and enhance the environment; and to enhance their appreciation of the environment resulting in positive environmental behavioural change (Bamberg & Moeser, 2007; Wals et al., 2014).

Environmental Education is a holistic process enabling individuals to identify environmental issues and make responsible decisions to resolve and improve the environment thru enhanced skills on critical thinking in a participatory approach. It provides opportunities to children and citizens to build their problem-solving and investigation skills and have an in-depth understanding on the issues of our environment thereby becoming them environmentally smart vigilant.

Although Environmental Education is not just an information about the environment, as it can be formal which refers to education inside a school or education institutions and informal which refers to any communication in any form via mass media, print media and social networks, museums and eco-tourism sites outside the school boundaries. There are other issues that people

can participate and contribute to solve the problems, but to become aware of it, one must be educated on the issues and concerns for him to know how they can they take part of it. However, it can be noted that most of the problems our country is facing such as poverty, hunger, unemployment, among others, are linked to environment.

These are the reasons why Environmental Education was chosen as the strategic research area in this paper. The primary purpose of which is to promote a holistic eco-consciousness of the society and the industries who are the major contributors of pollution causing problem in the country through diffusing information and empowering them with strategic programs and applications toward human and ecological well-being.

3.2. Review of Literature

Hadzigeorgiou & Skoumios (2013) contended that environmental awareness in the context of contemporary education and how young students can change their relationship with nature thru direct of first-hand and indirect experiences, thus promoting a more responsible behavior toward, and even respect for it. Children or young adults, who are close to environment, tend to relate to it as a source of joy, wonder and awe. This relationship is called “biophilia hypothesis”, however some advocates believes that this genetic bond behind such hypothesis may very well be a weak one, thus requiring additional learning experiences (Kahn, 1997;

Kellert, 2002). In this paper, it was given emphasis that environmental awareness can be in formal setting such as inclusion of environmental education in the formal school curriculum. It can also be informal which refers to approaches which includes certain programs and activities of the school through field trips, tree planting activities, visit of the Museums and Eco-parks, among others, which expose them to social and environmental issues. Now the question is whether such learning experiences can raise environmental awareness. It is no doubt that science ideas can help raise environmental awareness, but direct experiences will empower students or children to reflect upon the interrelationship between the physical and social world and their own life, and also upon the moral principles that guide their decision-making in regard to environmentally-related matters.

Environmental Education or Awareness is directly linked to environmental knowledge, attitudes and actions (Menze, 2010) or to knowledge which can have an effect on students' attitudes (Dimopoulos, Paraskevopoulos, & Pantis, 2009). Critical thinking also appears to be linked to environmental awareness and the fact that it is broadly defined as knowledge, critical thinking and attitudes can be justified by the concept of awareness per se, since it is awareness that leads to a change in perception, necessary for a change in attitude which in turn, is a prerequisite for a change in behavior and action.

Environmental Awareness, as regarded in this paper, is taken to mean knowledge of the interrelationships between issues, problems and human life, such as how a person feels, thinks, behaves and acts. And such environmental awareness can be seen as a prerequisite for environmental literacy which refers to the contextualized and detailed understanding of issues and problems and which allow a person to evaluate and make decisions as citizens specially on environmentally-related issues.

Further, providing children with opportunities to appreciate the beauty of natural environment at young age, through direct experiences is very crucial not only for the development of bond with nature but for the development of children's sense of place. According to environmental psychology literature, children's sense of place is affected by a number of factors, including aesthetic factors (Bechtel & Churchmen, 2002). An aesthetic appreciation of the natural world, therefore, through a vicarious experience, especially through the experience of a sense of wonder, may very well encourage environmental awareness, by affecting, at the same time, children's choice of favorite places in nature. A child experience of a sense of wonder, evoked through an aesthetic appreciation, can foster environmental awareness by raising awareness of the beauty of the natural world.

Integration of Environmental Education into the whole system of formal education and also across the school curriculum, will not compensate for lack of strategies that can raise environmental awareness to children. Direct interaction and experiences on social and environmentally related issues will empower them to act, think, participate and decide independently thus promoting awareness and application of problem-solving skills.

Skanavis & Sarri (2001) examined and analyzed the environmental education as a tool for environmental management in Cyprus and determines the extent how public participation's critical thinking and problem-solving skills on issues of environmental significance can be promoted. Like many countries, Cyprus is experiencing environmental issues such as water resource problem, water pollution, coastal degradation and loss of wildlife due to urbanization, among others. And for every crisis, a solution suggested that is most useful and effective over time is Environmental Education, an education which makes the citizens aware, willing and interested in the social environmental issues and encourages them to participate in the decision-making process, enables them to acknowledge their responsibilities and understand the environmental functions, involves them in protecting the environment and finally orients them in thinking globally and acting locally. Participation may mean involvement in determining the scope of a project/decision, evaluating the relative significance of the likely impacts, providing specialist knowledge etc. In other words, public participation can be put into practice throughout

the decision-making process; before the decision is made, by communicating, exchanging views, understanding needs and discussing new proposals and alternatives, but even after the decision is made, by informing the public of the decisions made, the reasons considered, the outcomes expected. It is vital that public participation occurs at an early stage. Making people feel that they have the right to affect a decision modifies their behavior in a positive way, mostly because then they are given the chance for a say. In this way, later conflicts and hostilities induced because of decisions made without their contribution are avoided (Vanclay, 1996).

Environmental Education can be formal or non-formal. This has to do with the way it is applied and where it takes place. Education in schools is the formal one, where teachers and students are involved in the typical school classroom interaction and learning processes. Non-formal is the education which can be applied outdoor, in museums, parks, aquaria and zoos, through eco-tourism, in art galleries and historical sites, via the mass media and in any form of environmental communication that does not operate within the school boundaries.

Non-formal environmental education can be applied in any case, at any moment, since it does not require school environments (functions), it is independent of age, sex, location and social systems. Non-formal EE is the communication that may be coming from many directions, and can be of

many forms. It is the form of education which can send messages about the environment to the broad spectrum of citizens where classic institutions and schools cannot offer their help. Therefore, the non-formal education has a greater "audience". Communication has to do with the handling of environmental information, aims at the improvement of our ability to decode information, to exchange it and transmit it. Environmental communication aims at increasing people's awareness on the environmental issues. Building people's knowledge and abilities to participate are the main tasks involved. We need environmental awareness in all levels: personal and community ones. We need to educate the citizens, who also happen to be the consumers of everyday services and goods; we need to educate the producers and the decision makers. Decision makers belong both to the governmental sector and to private industry, hence, we have to move towards both axes and educate all, so as to have an integrated result. A complete educational program will make people aware of the environmental status quo, and able to act and interact in order to solve the environmental problems that arise, and finally will enable people to exert pressure in the political arena (Skanavis and Sarri, 2001).

Investing into EE programs could result in promoting environmental behavior and ecological thinking. Data showed that TV, media, travel and the impact of environmental disasters have played an important role in promoting concern, while the impact of "outdoor" activities is also highly significant (Sterling, 1999). Therefore, emphasis must be placed on the role

of media in the environmental education and awareness campaign. The environmental needs of the ones employed in the media must be identified and environmental programs tailored to their needs must be provided. The media sector in Cyprus includes the television network, a range of newspapers and magazines, and also several radio stations broadcasting either island wide or locally.

The benefits of Environmental Education are many and are self-evident. Environmental Education, with the goal of developing a population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones, clearly enhances the quality of life, not only for individuals, but also for communities, states, nations and even the world (Skanavis, 2001). The most popular rewards of EE can be: advances of high quality, interdisciplinary education tied to the interest of the community, creation of job opportunities in the environmental field, promotion of public health, environmental protection along with economic development and encouragement of stewardship of natural resources. It is very important to tackle issues dealing with the ability of people to access environmental information, with producers' responsibilities and consumers' rights, with decision-makers' choices and public pressure on the political decisions. The community of Cyprus and its market are significant and the awareness of the citizens is of vital

significance in securing sustainable development (Skanavis and Sarri, 2001).

A report by Ardoin (2009) entitled “Environmental Education: A Strategy in the Future” discussed that policy tools of regulation and market incentives often prove insufficient to the task of coping with significant environmental management problems. Other policy options such as education, information provision, and voluntary measures should be given priority by policymakers in order to enhance the capacity and motivation of people to take action. The report also emphasized the four (4) truths about environmental education: 1) Environmental Education is Lifelong Learning; 2) Environmental Education is Interdisciplinary; 3) Environmental Education is a Proven Strategy; and 4) Environmental Education is About Critical Thinking and Citizen Participation.

One of the actual, simple and direct applications of environmental education is the project of Solar Youth, a Connecticut-based nonprofit organization that offers youth programs. Solar Youth gathered youth from the community to learn about their local environment, identify environmental issues, and design and implement creative action projects. The projects included addressing issues of pesticide use, watershed health, and building footbridges to access green spaces. Another application was by the National Council of Churches Eco-Justice, a group of faith-based communities. Through the “Education for Advocacy”, they learn about

climate change, energy and water conservation, land use, biodiversity, green building and sustainability. With these initiatives, the program has successfully leveraged the environmental education model – from awareness to action – to help congregations "green" their buildings and call on Congress to enact just and sound climate and energy policy (Ardoin, 2009).

3.3. Analytical Framework

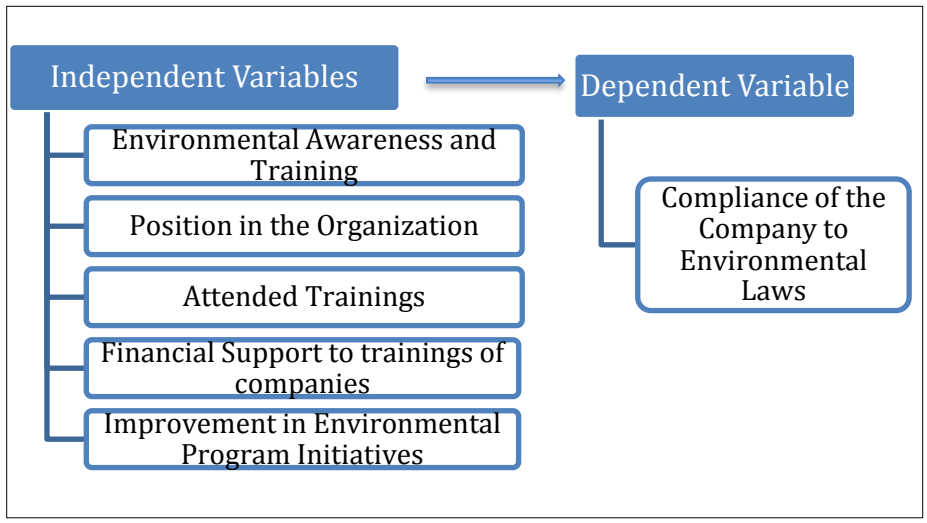


Figure 1. Shows Environmental Environmental Awareness and Training, Position in the Organization, Attended Trainings, Financial Support to Trainings of Companies and Improvement in Environmental Program Initiatives as Independent Variables and Compliance of the Company to Environmental Laws as the Dependent Variable

3.4. Variables and Hypotheses

Dependent Variable

The Dependent Variable is a variable assumed to depend on or be caused by another or may also be called as the effect or the outcome. In this research, the

dependent variable is the compliance of the public and private institutions as a result of being equipped with knowledge on the various environmental regulation the country is enforcing. This knowledge may be the outcome of formal and non-formal training or awareness according to where it took place and how it is being applied. With their compliance, occurrence of legal sanctions or fines of the regulated industries will be lessened if not prevented, breaches of compliance will likewise be eliminated, a harmonious relationship with the implementing agency of the government shall be created and thereby attaining a healthy environment and better well-being.

In this paper, it is hypothesized that non-occurrence of any violation on environmental laws such as Water, Air, Hazardous and Solid Wastes Laws or breaches of compliances such securing legal permits, reportorial requirements among others, are being regulated and monitored by concerned government agencies such as the Department of Environment, Department of Trade and Industry, Department of Health, etc., means compliance with the said laws.

Hence in the questionnaire, respondents were asked if their company incurred violation/s which was answerable by yes or no wherein yes means presence of violation equivalent to non-compliance with the environmental laws.

Independent Variables

The Independent Variable on the other hand is the one that influences dependent variable and it aims to understand and describe the dependent variable. By

analyzing it with this research, the solutions to the problems may be known or identified. Below is the list of independent variables used in the study that are assumed to affect compliance of organizations with the environmental laws:

1. Environmental Awareness and Training – this variable asks if the respondents have undergone environmental awareness trainings related to the Clean Air Act (R.A. 8749); Clean Water Act (R.A. 9275); Ecological Solid Waste Management (R.A. 9003); Environmental Impact Statement System (P.D. 1586); Toxic Chemicals and Hazardous Nuclear Wastes Control (R.A. 6969); and Climate Change Act (R.A. 9729) while being part of the organization. Environmental Awareness Training is a measure of Environmental Education that is provided by the companies to their employees to specifically learn environmental laws. Environmental Awareness Training is not only familiarity with the laws but how it can be properly applied in everyday lives and routines as an ordinary citizen and as the representative of the company. This is one of the formal trainings which develops the skills and creative thinking capacities of the PCOs on the application of Environmental Laws and the technical requirements which includes collaboration with different concerned agencies and compliance with the permitting and other documents or report submission.

Hypothesis: It is hypothesized in this study that if the PCOs has sufficient knowledge in this variable, then it will increase the chance of the company to be compliant with the environmental regulations.

2. Position – target respondents of this study are Pollution Control Officers (PCOs) of randomly selected companies. The respondent were the chosen representatives of their organizations or companies who are tasked to handle all environmental related matters including its compliance on permitting and reportorial requirements and collaboration with the concerned government agencies. A PCO position will focus and give due importance to the tasks assigned to him/her compared to other employees in the organization whose are not related on environmental laws compliance

   Hypothesis: If the respondent is a PCO who will be knowledgeable on environmental laws compliances, then the organization has a higher chance of compliance with the environmental related concerns.

3. Attended Trainings Before – this variable asks the respondents if they have attended trainings related to environmental laws before they were assigned or been part of the company.

   Hypothesis: If the respondent has undergone trainings related to environmental laws before, then there is a higher chance to be compliant.

4. Paid by Company – this variable asks the respondent if the training/s related to environmental laws that he/she attended is an initiative and paid for the company. The company that invests money on training of its employees on environmental laws gives more importance to the environmental concerns hence intention to comply is higher also, therefore expected to be more compliant with the laws. Moreover, companies which invests on the learning enhancement of its employees are likely interested also on what the company will gain for such training or education. It may not only beneficial to its employees, but they are expecting that the training will impart information that may prevent them from incurring violation and thereby assumed that they understand the cost of training is cheaper than paying high penalties or administrative sanctions.

   Hypothesis: If the trainings on environmental laws are initiated and paid for by the company, there is a higher chance of compliance as manifested by the intention of the company to comply.

5. Difference After – Before – this variable represents the difference between the company having environmental initiatives AFTER being assigned as PCO of the respondent minus the responses that the company had environmental initiatives BEFORE being assigned as PCO

Hypothesis: If the company had environmental initiatives after the respondent was being assigned as PCO, it means the respondent was significant in the change and it will reflect on the compliance of the company with environmental regulations.

Controlling Variables

The Controlling variable refers to contributing factors that are fixed or eliminated in order to clearly identify the relationship between an independent variable and dependent variable. In this paper, sanctions, penalties or administrative fines were some of the control variables which it are very important because they will affect the outcome intended to be measured in this study. Implementation of a law usually comes with a punitive clause such as administrative and legal fines. In contrast, instead of providing sanctions, encouragement to comply can also be through giving incentives for the best practices or exemplary initiatives. Knowing the laws were important but the consequences of it whether good or bad ways could get a possible encouragement from the public.

Moderating Variables

The Moderating variable is one that has a strong contingent effect on the Independent and Dependent Variable relationship. In this paper, the moderating variables will be the values or attitudes of the Pollution Control Officers (PCOs) towards environmental regulation compliance. Their actions and inactions

towards attaining the goal of sustainable development and how they contribute to the organizations in implementing and complying with the requirements of the environmental regulation of the country were the moderating variables in this paper. The values and attitudes of the public is very crucial in attaining the outcome of this study which is compliance through utilizing environmental education as alternative enforcement tool. The higher the level of attitudes towards compliance will also elevate implementation of the laws but the lower the level of attitudes of the public will result to deterioration of governance and environmental law enforcement in the country.

3.5. Research Methodology

A. Data Collection

To ensure reliability of information, primary data were gathered for this research through the use of questionnaires and interview. Survey questionnaires were provided to company's representative in charge for environmental concerns and selected representatives from the Local Government Units (LGU). Random interview with Pollution Control Officers (PCO) and Managing Heads (MH) was also done in every selected industry who is tasked to resolve environmental issues in the facility.

Closed-ended questions were incorporated wherein the respondents were asked to select and answer from among the list provided by the researcher. This survey technique is easily analyzed because each answer can be given a number or

value, therefore statistical interpretation can be assessed. The questions to be used in this research are called convergent questions that bring conversation gradually to a convergence on a single point or decision.

Two hundred fifty (250) respondents were interviewed and provided with questionnaires. The respondents were composed of PCOs, MHs or representatives from both the private companies and selected Local Government Units (LGUs).

B. Data Analysis

The results of the interview or the data gathered will be analyzed into two main parts: 1) Descriptive Statistics, and 2) Binary Logistic Regression Analysis. Descriptive Statistics will be incorporated to provide information on the characteristics of the respondents. This will help the researcher in drawing the conclusion and relating the results to the main objectives of the study.

Second part of the analysis is the Binary Logistic Regression Analysis. Binary Logistic Regression or Logistic Regression is an extension of simple linear regression. This is the appropriate regression analysis to conduct when the dependent variable is dichotomous or binary (e.g., sex [male vs. female], response [yes vs. no], score [high vs. low], etc.).

In this thesis, the researcher wants to know if environmental education and other factors will affect the compliance of the organizations to environmental regulations. The dependent variable in this case is the organization's compliance which is measured by the absence of the environmental regulation violation. If there is no violation, it is assumed that the said company is compliant. The respondents in this research were asked if their company incurred environmental violations wherein they can answer "yes" or "no". Since the dependent variable is answerable by only two options, this variable is treated as dichotomous or binary hence the application of the Binary Logistic Regression Analysis.

Binary Logistic Regression Analysis is the statistical technique used to predict the relationship between predictors (our independent variables) and a predicted variable (the dependent variable) where the dependent variable is binary. There must be two or more independent variables, or predictors, for a logistic regression. The IVs, or predictors, can be continuous (interval/ratio) or categorical (ordinal/nominal). All predictor variables are tested in one block to assess their predictive ability while controlling for the effects of other predictors in the model (Statistics Solutions, 2012).

The main independent variable of the study is Environmental Education where respondents gained knowledge on the provisions of the environmental regulations. The knowledge and awareness they gained from the training were very essential in the sustainable management of our environment and non-

adherence to the provisions of the laws of the land will compromised the and organization's overall and financial standing. Being educated is the cheapest was yet the most powerful to avoid breaches or records of violations from regulatory government bodies. Needless to say, that results of non-compliance are far more expensive than investing early on educating oneself on how to properly deal and comply with the laws.

However, some of the country's culture and practices contribute to the incurring breaches of some organizations. As long as there are no evident sanctions, as long as the regulatory bodies will not discover the wrongdoings, and as long as there are friends or relatives in the government who can be useful to conceal the violations, they will continue to be in status quo.

Gaining knowledge and awareness from environmental training enables one to understand his responsibility to the environment and able to determine his own contribution for making it sustainable for present and future generations. Deterrence from the provisions of the laws of the land is the result of lack of knowledge on the process and proper procedure of it. The public may be aware that there existing environmental laws, however they are bereft of understanding on the impacts of one's good and bad deeds towards the environment. They are deprived of skills on how to properly manage environmental protection and sustainability, either due to lack of initiatives from the government or they just assume full responsibility to the government or persons in authority to take care of the environment.

The prominent environmental regulations in the Philippines are:

1. **Clean Air Act (R.A. 8749)** - is a comprehensive air quality management policy and program which aims to achieve and maintain healthy air for all Filipinos (Primer on the Clean Air Act, 2003).
2. **Clean Water Act (R.A. 9275)** - aims to protect the country's water bodies from pollution from land-based sources (industries and commercial establishments, agriculture and community/household activities). It provides for a comprehensive and integrated strategy to prevent and minimize pollution through a multi-sectoral and participatory approach involving all the stakeholders (DENR-Environmental Management Bureau, n.d.).
3. **Ecological Solid Waste Management (R.A. 9003)** - declares the policy of the state in adopting a systematic, comprehensive and ecological solid waste management program that ensures the protection of public health and the environment and the proper segregation, collection, transport, storage, treatment and disposal of solid waste through the formulation and adoption of best environmental practices (Aquino et. al, 2013)
4. **Environmental Impact Statement System (P.D. 1586)** - the law provides that no person, partnership or corporation shall undertake or operate any such declared environmentally critical project or area without first securing an Environmental Compliance Certificate (ECC) (Decena, 2017)

5. **Toxic Chemicals and Hazardous Nuclear Wastes Control (R.A. 6969)** - under the Act, manufacturers and importers of new substances are required to notify the Department of Environment and Natural Resources (DENR) of substances they intend to use, if they are not listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS) (Chemical Watch, n.d.)
6. **Climate Change Act (R.A. 9729)** - primarily conceived as the country's response to the worldwide phenomenon on climate change. Towards the attainment of this goal, R.A. No. 9729 allowed mainstreaming of climate change into government formulation of programs and projects, plans and strategies, and policies, creation of Climate Change Commission, and establishment of Framework Strategy and Program for climate change (Aquino et. al, 2014).

Another independent variable used by the researcher is the position of the respondent. It is assumed in this study that if the respondent is a Pollution Control Officer, the higher the chance of the company being compliant.

SPSS or Statistical Package for the Social Sciences also known as IBM SPSS Statistics, is a software package that will be used for the analysis of statistical data.

Chapter IV. Survey Results and Analysis

This chapter presents the results of the data gathering procedure. Descriptive Statistics will show the characteristics of the respondents and of their responses.

4.1. Descriptive Statistics

Table 1 below describes the characteristics of the respondents based on their sex, position in the organization, and type of organization where they are affiliated.

Out of 250 respondents, fifty-one percent (51%) are male, thirty-five percent (35%) are female, and fourteen percent (14%) preferred not to say their sex.

When it comes to their position in their organization, it can be seen that fifty-nine percent (59%) of the respondents are the Pollution Control Officers (PCOs) of their companies. Twenty-five percent (25%) are representatives of the owners or the company which is neither PCO or Managing Heads and who deal with their company's environmental regulations. Nine percent (9%) are managing heads and seven percent (7%) are the owners of the company.

Also included in Table 1 the type of organization where the respondents belong. Seventy-five percent (75%) of the respondents came from a private company while twenty-five percent (25%) came from LGU or Local Government Unit.

Sex		Position		Type of Organization	
Male	51%	Pollution Control Officer	59%	Local Government Unit	25%
Female	35%	Representative	25%	Private Company	75%
Prefer Not To Say	14%	Managing Head	9%		
		Owner	7%		

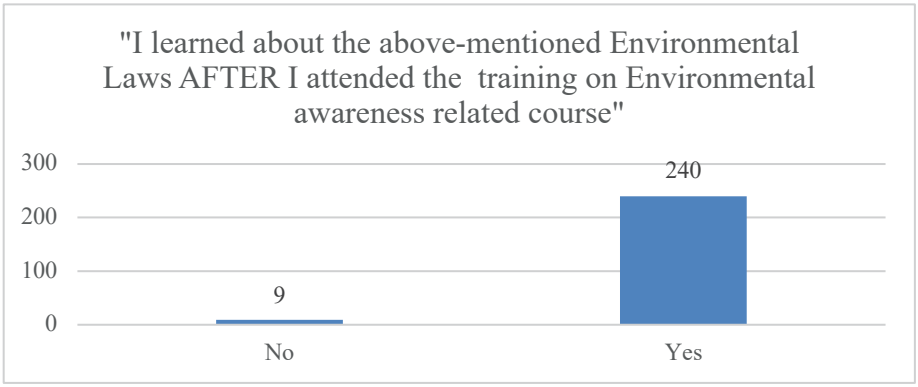
Table 1. Respondent's Sex, Position, and Type of Organization

4.2. Qualitative Analysis of Results

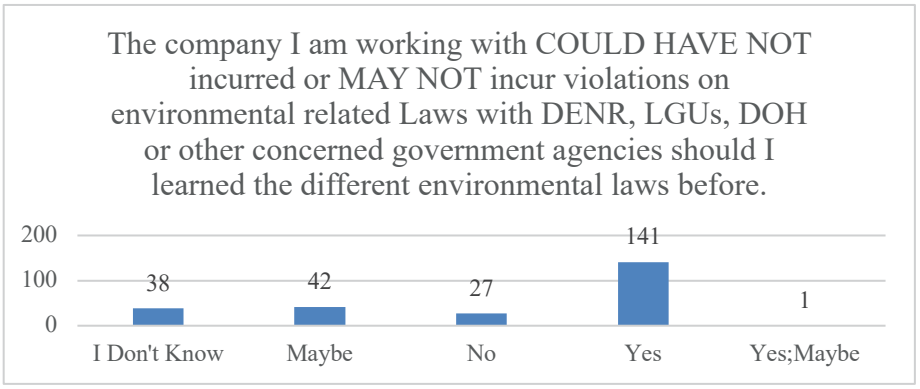
The Binary Logistic Regression Analysis was part of the quantitative analysis. Quantitative analysis is the numerical representation and manipulation of observation for the purpose of describing and explaining the phenomena that those observations reflect. However, this study will also apply qualitative analysis in order to provide support to the conclusions drawn out of the quantitative analysis and provide more in-depth understanding on the topics being discussed.

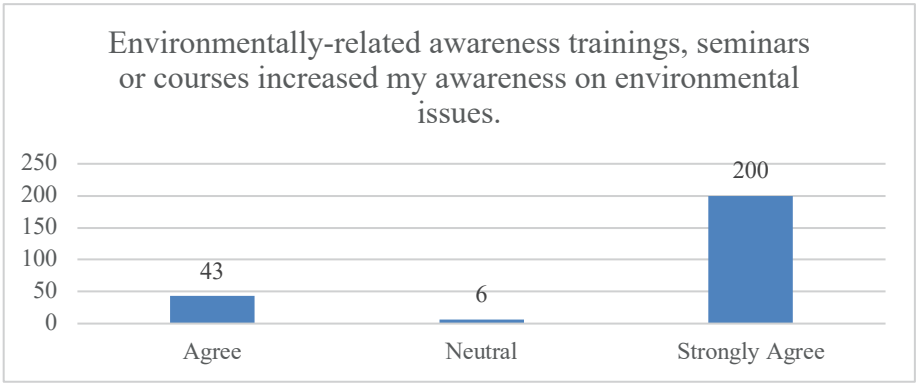
In this part of the paper, answers of the respondents to particular items in the questionnaires will be discussed. Respondents of this study are composed of Pollution Control Officers (PCOs), representatives of the company dealing with their environmental regulation compliance, managers, and owners of the company.

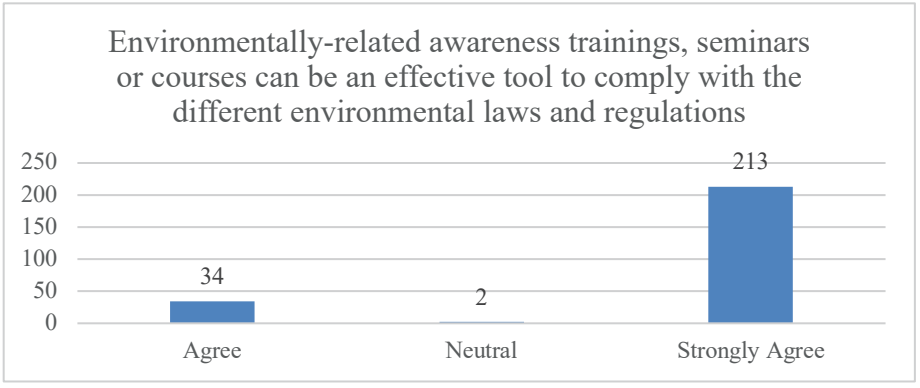
It was established by the result of the Binary Logistic Regression Analysis that the factor Environmental Education in organizations through trainings is very important in making in the compliance of the companies with the environmental regulations. The illustration below is a support to that conclusion considering that two hundred forty respondents in this study even said that they learned the Environmental Laws after they have attended the trainings.



Looking at the attitudes or behavior of the Pollution Control Officers and/or the representatives/managers/owners of the companies is important in assessing their impact to the compliance with the environmental regulations. Table below shows their responses that most of them think that their company would have not incurred violations related to environmental laws if they have been taught of those laws before. Hence, they support the high importance of environmental education in the enforcement of the environmental regulation in the country.

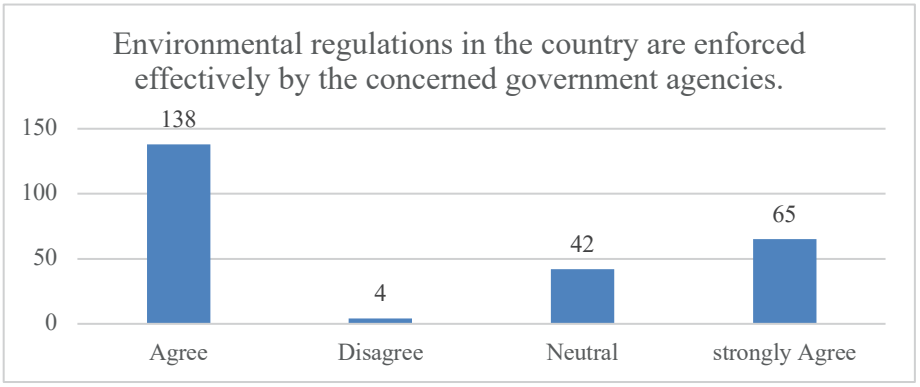




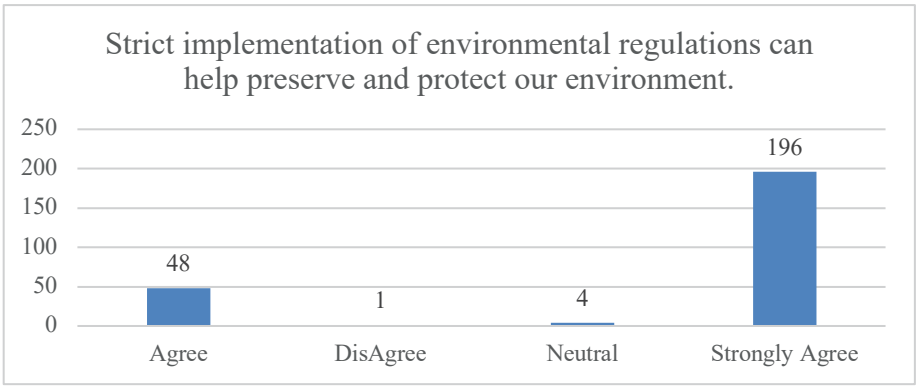


Fortunately, these Pollution Control Officers or representatives of the organizations also think that environmental regulations in the country are enforced effectively by the concerned government agencies in the Philippines.

This is a good feedback and observation as environmental education will be pointless if there is poor implementation of the laws.



Most of the respondents agree that strict implementation of environmental regulations can help preserve and protect the environment. Environmental education increases the awareness and compliance of the environmental laws. Therefore, increasing environmental education has a positive impact on the implementation of environmental regulations that in the long run will help preserve and protect the environment.



4.3. Binary Logistics Regression Result

Case Processing Summary							
		N	% Share				
Selected Cases	Included in Analysis	198	79%				
	Missing Cases	52	21%				
	Total	250	100%				
Classification Table (Baseline Model)							
			Predicted				
			Compliance		%		
	Observed		Yes	No	Correct		
Step 0	Compliance	Yes	128	0	100		
		No	70	0	0		
Overall Percentage					64.6		
Classification Table (Model with Independent Variables)							
			Predicted				
			Compliance		%		
	Observed		Yes	No	Correct		
Step 0	Compliance	Yes	112	16	87.5		
		No	53	17	24.3		
Overall Percentage					65.2		
Omnibus Test of Model Coefficients							
	Chi-square	df	Sig.				
Model	16.651	7	.020				
Model Summary							
Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square				
1	240.594	.081	.111				

Hosmer and Lemeshow Test							
Step	Chi-square	df	Sig.				
1	8.008	8	.433				
Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.604	.149	16.483	1	.000	.547
Step 1	Environmental Awareness and Training	.209	.078	7.287	1	.007	1.233
	Position	-.417	.314	1.766	1	.184	.659
	Attended Trainings Before	-.452	.714	.402	1	.526	.636
	Paid by Company	.092	.678	.019	1	.892	1.097
	Difference After-Before	-22.498	40191.953	.000	1	1.000	.000

Table above shows the summary of results of the Binary Logistic Regression Analysis using the SPSS software.

First is the Case Processing Summary. The dependent variable of this study is the compliance of the company with the environmental-related laws. This compliance was measured through the occurrence or non-occurrence of the violation against said laws of the company. When asked if their company violated any environmental-related laws, some respondents answered “I don’t know”. This type of response was counted as missing cases by the SPSS software and hence not included in the analysis. Out of the 250 respondents, seventy-nine percent (79%) of them were counted as to having valid responses

specially with the dependent variable which was regarding compliance to the environment-related laws.

Second is the Classification Table with the baseline model – the null model that does not include the independent variables. The model always guesses "yes" because more respondents are compliant with environmental regulations than those who are not. The overall percentage row tells us that this approach to prediction is correct 64.6% of the time – hence this is better than tossing a coin or whatever prediction method.

Classification Table with the independent variables is almost the same with the previous one but is now based on the model that includes the independent variables. As we can observe, the model is now correctly classifying the outcome for 65.2% of the cases compared to the 64.6% in the null model.

Next is the Omnibus Tests of Model Coefficients which is used to check that the new model with independent variables is an improvement over the baseline model. In this case, chi-square tests are used to see if there is a significant difference between the Log-likelihoods (specifically the -2LLs) of the baseline model and the new model. Since the new model has a significantly-reduced -2LL compared to the baseline, then it suggests that the new model is explaining more of the variance in the outcome and is an improvement. Here the chi-square is significant (chi-square=16.651, df=7, $p<0.05$).

Hosmer and Lemeshow Test has a rule of thumb that this test statistic indicates a poor fit if the significance value is less than 0.05. Based on our result below, the significance is .433 which is more than 0.05 which therefore means that the model is fit and adequately describes the data.

The most significant result in the Binary Logistic Regression Analysis is the Variables in the Equation. It shows which of the independent variables have a significant impact with the dependent variable which in this case is the compliance of the company to environmental regulations. **It can be seen in the table that the only independent variable that is significant is the Environmental Awareness and Training which is significant at 0.05 significance level (p=.007). The value under Exp(B) which was 1.233 tells us that for every one-unit increase in the Environmental Education (in this case, the number of environmental laws that the respondents are aware and educated of) constitutes to a 1.233, approximately to 1, effect to the dependent variable which is compliance to the environmental regulation, holding all other independent variables constant.**

In interpreting the impact of the variables, we look at the Sig. and Exp(B). For the variable Position, it resulted to as not significant. Position is coded as 1 for PCO or Pollution Control Officer and 0 for non-PCO. Exp(B) is better known as the odds ration predicted by the model. **Exp(B) for Position is .659 which means the model predicts that the odds of complying to the environmental**

regulations are .659 times higher for Pollution Control Officers (PCOs) than non-PCOs.

All other independent variables such as the position of the respondent, trainings attended before being in the company, if the trainings were paid by the company, and difference with the environmental initiatives after-before being assigned as PCO were not significant.

Compliance with Environmental Regulations:

Comparison between LGU and Private Company

	Private Company	LGU	Total
Total Respondents	188	62	250
With Violation	53	17	70
Compliant	135	45	180
% With Violation	28%	27%	
% Compliant	72%	73%	

Above is the comparison based on survey results of the compliance of Local Government Units (LGUs) and Private Companies with environmental regulations. Out of the 188 total respondents from private companies, 135 or 72% said that their company has no violation with any environmental law which means they are compliant. While for the LGU, 45 or 73% of them were compliant to environmental laws.

Chapter V. Summary

5.1. Summary of the Study

Countries all over the world are racing for development and more resources are being consumed while compromising the environment. Environmental resources should be protected and sustained in order to secure the needs of the future generations. The protection of the environment is mostly on the shoulders of the government. Environmental laws and regulations are established to serve as guidelines on how everyone should act and every organization should operate without compromising the environment. Penalties and/or sanctions are being given to those who violate the environmental laws. However, just mere establishing the laws and catching the violators are not sufficient in ensuring that the individuals and firms will comply with the laws and participate in protecting the environment.

This thesis explores the utilization of environmental education as alternative enforcement instrument of environmental regulations. This study takes on the actual and direct application of environmental education through trainings of different organizations in the Philippines and its effect to their compliance with the environmental regulations.

Pollution Control Officers (PCOs) of different companies were being interviewed with the use of structured questionnaires. Their and of their organizations' identities were treated confidential as they honestly provided

information related to their compliance and violation towards environmental laws. Some of the companies do not have their own PCOs and the job was taken by a representative, a manager, or the owner him/herself.

Results of the survey were analyzed into 3 parts: descriptive statistical analysis of the characteristics of the respondents, qualitative analysis, and quantitative analysis using the SPSS software program.

Descriptive statistical analysis showed that most of the respondents are male, with a position of Pollution Control Officer, and belongs to a private company.

Qualitative analysis provided an in-depth illustration on the attitudes and belief of the Pollution Control Officers (PCOs). The analyses showed that PCOs believe environmental education through trainings has a high positive effect in being more compliant with the environmental regulations and laws. Being aware with the effects of their company's practices and the penalties attached to violating the laws motivates them to be more compliant. They also believe that implementation of the environmental regulations in the Philippines is effective and that it will help in preserving the environment in the long run.

Quantitative analysis with the use of the Binary Logistic Regression was incorporated in order to examine how the independent variables affect the dependent variable based on the hypotheses set by the researcher. Results of the analysis showed that the position of the respondent (whether a PCO or otherwise) has no significant effect on the compliance of a company towards

environmental regulations. Other independent variables such as trainings attended before being in the company, if the trainings were paid by the company, and difference with the environmental initiatives after-before being assigned as PCO were also not significant.

The only independent variable that resulted to as significant ($p<0.05$) is the variable Environmental Awareness and Training. This variable takes into account the number of environmental awareness training that the PCO undergone while being part of the organization. This variable is the measurement of Environmental Education in a corporate setting wherein its application and impact are directly seen in the compliance of the company. Therefore, based on the results of the study, it is concluded that Environmental Education, measured through environmental awareness and trainings, directly affects the compliance to environmental regulations of companies. This variable is hence a fitting and relevant alternative enforcement instrument of environmental regulations.

It is noteworthy that the PCOs who have attended environmental awareness training subsequently gained knowledge on the environmental laws itself and material information on how to properly comply with the permitting, reportorial, technical measures and similar requirements which serves as guidelines in order to prevent occurrence record of violations from the jurisdictional regulatory bodies. To put it simply, knowing the rules therefore gave the benefits of knowing how to put into action even if takes more efforts,

more resources and more creative thinking application. On contrary, sometimes even if people know what the rules or regulations are, still they resist or failed to make part of it due to culture and prevalent accepted practices for a long time. These are unacceptable practices specially those who are already educated in this field, but they opt not to follow with thinking that it is fine as long as they were not caught or issued notices of breaches. Cliché as it is, that no one is exempted in knowing the laws being inadmissible as defense, however reality happened on the ground that many still are illiterate on the negative impacts of the careless acts they make towards the environment. Moreover, simple initiatives would have make a great impact not only to other people lives but to the whole country specially when it is religiously and continuously done.

Additional analysis was also done by comparing the compliance of Local Government Units (LGUs) and Private Companies. Based on the analysis of survey results, government units have a higher percentage rate of compliance compared to private companies but with just 1% difference. It can be therefore concluded that environmental regulations are both applied by the organizations, however LGUs were expected to be more compliant and have more initiatives, programs and practices which the community members can participate and benefits.

The local government units' chairperson in the country as usually called the little president can exercise all the powers of the National President such as legislative executive and judicial powers. The LGUs can enact and pass special

laws within the community, administer, implement and penalize those who will circumvent it and enjoy the financial autonomy for some cases. Their main responsibility is to ensure security of the community and sustainability in terms of environment programs and practices that will benefit everyone. Sustainable programs on proper wastes disposal, greening programs, clean up activities and livelihood training activities should be well implemented not only as part of their responsibility to its voters but as a common people living in the community. Wherein this field, they are expected to exceed the anticipations of its stakeholders, continuous environmental education is still needed to enforce for the leaders and the community members. Taking care of the environment is a continuous process that need to undertake with a strong leadership and political will that depends on the hands on the members of the Local Government Units and participation of the stakeholders. Moreover, to ensure the short and long term sustainability of the local environmental initiative projects relies on the financial support that will be given by the National government. Without this, no matter how aggressive and creative the local governments, the fuel is the key for the realization of everything.

5.2. Policy Implications and Recommendations

Policy implications are incorporated in a study to discuss how the research can influence existing systems either based on programmatic, community-oriented and/or state-level perspective. The main highlight of this study was the establishment of the theory that environmental awareness and trainings resulted

to being knowledgeable to environmental education thereby increases the compliance to environmental regulations of a company.

The Department of Environment and Natural Resources - Environmental Management Bureau (DENR-EMB) is the government agency of the Philippines that is mandated to implement the national environmental laws such as the Clean Air Act (R.A. 8749); Clean Water Act (R.A. 9275); Ecological Solid Waste Management (R.A. 9003); Environmental Impact Statement System (P.D. 1586); Toxic Chemicals and Hazardous Nuclear Wastes Control (R.A. 6969); Climate Change Act (R.A. 9729); and National Environmental Awareness and Education Act (R.A. 9512). To implement these environmental laws, environmental education can be used as alternative enforcement instrument. The DENR-EMB should conduct a massive environmental awareness campaigns and trainings to every organization, government agencies and private companies, to ensure compliance of those organization to environmental laws. The education or awareness of the PCOs or representatives of the company will make them understand why certain laws are made to protect the environment and what are the impacts of their company towards preserving and sustaining the country's natural resources.

Since it is proven how important and useful the Environmental Education is, the government of the Philippines should also start the awareness campaign to students, high school and college levels and to single every people. In small ways, the youth already contributes to the pollution in the environment and

minimizing the occurrence will greatly help specially that Philippines has a young population. And not just with organizations and the youth, DENR-EMB should educate regular households with the environmental regulations as they also directly contribute to trash and other pollutants of the land. The mission of educating everyone of environmental regulations is but a great ambitious task but it could be possible by establishing partnership with government agencies and private sectors while being spearheaded by the DENR-EMB. Philippine government should annually a lot a budget for environmental awareness campaign through mass media, television and radio advertisements, television and radio programs, billboards, leaflets, brochures and other similar form in order to educate every person in the country and there will be no more excuse from ignorance of the laws and compliance therewith.

The Saemaul Undong movement practice in South Korea which provides diligence, self-governance and collaboration in traditional Korean communities to encourage members to participate in the development is highly recommended to be also implemented in the Philippines, but with modified concept and using the funds for environmental awareness purposes. The Saemaul Undong (SMU, 새마을운동), known as the New Village Movement, is a self-help community movement to modernize the underdeveloped rural Korean economy. (koreanlii.or.kr/) The government should provide fixed amount for the Local Government and entrust the locals to implement programs for the community members, students and leaders for formal and non-formal environmental

education awareness activities. This may include forums, trainings, trips to museums, parks, mountains, islands, companies which are implementing best practices, contest for environmental related themes and other similar programs that will encourage and enrich the knowledge of the students and community members on environmental protection and preservation. Private and public organization should likewise implement the same and empower the nearby communities and students to be environmental warriors as part of their Corporate Social Responsibility. Activities shall include first hand sharing experiences such as converting used materials into bags or how to make pencils and papers out of woods, making bricks out of garbage and other activities which will enhance the knowledge of participants not only to preserve the environment but also how to make used out of the things we see in our environment.

5.3. Conclusion

Scholars articulated on the importance of education which enhances citizen active participation on environmental issues towards creating solution to those problems. Environmental education is more than just information about environment. It increases our awareness and knowledge on environmental issues, it teaches individuals critical-thinking, enhances problem-solving and decision-making capacity and most of all influence others on environmental protection advocacy. Capacitating individuals' knowledge on Environmental Education is not only though formal

education but more importantly it should be non-formal or direct participation through providing experiences and opening their knowledge on the real-life situations. Moreover, Environmental Education could be an effective enforcement tool by providing information on environmental compliance's administrative sanctions and further criminalizing deliberate violations in order for the companies to act and comply accordingly. The punitive aspects of the laws usually encourages compliance, participation and cooperation of the public which is also called as the "teeth of the law". But more than stressing on the negative implications of the non-compliance with the laws, sometimes people were more encouraged to comply when some benefits will be awaiting for them if they able to abide and incentives that they may used after giving efforts on non-defiance with the regulations.

Although more often, people will only comply after the blunt consequences of their non-compliance confront them such as penalties, fines and sanctions that may affect their financial capacities. Moreover, compliance depends largely on the attitudes of the public and regulated industries, the values of the person in charge or representative more than the law required them to be.

People will contribute in an effort to solve their problems when they know them, when they know where and how they can participate, what are the consequences and the implications and what should be changed and how. To become aware, someone should be "educated" on issues of concern.

Most of the significant world problems such as illiteracy, hunger, pollution, racism and poverty are linked to the environment. The education for the environment, i.e. the dissemination of information on environmental interactions, will help to overcome such problems in the long run and secure a quality life.

The disciplinary characteristics of a person is a controlling factor of the reasons of compliance and non-compliance, the inner intent of a person to follow whether or not disadvantages flip more than the advantages outcomes. The laws have always been in our system and the country is struggling to give the state a promising healthy life but the enforcement has always been a challenging task to the government and the agencies mandated to enforce it.

Environmental Laws in general are very difficult to implement considering it requires a vast requirement from the industries including exerting efforts and high legal fees in securing the required permits and the continuous submission of compliance status reports to the Organization. And although the government is very strict in the imposition of penalties and fines, there are still occurrence of deliberate breaches of compliance to permitting conditions, reportorial requirements and environment related practices. With this study, it was determined the reasons behind their resistance and defiance to the laws resulting to failure of enforcement or implementation.

The problem of resistance of the public as well to cooperate in the proper wastes disposal and in initiating activities for the welfare of the environment in their areas and the lack of political will and weak enforcement of ordinances on the part of the local executives were among the challenges of the country in the local level. However, through continuous information and dissemination campaign, it can increase the level of awareness of the community and may lead to public participation in the compliance to these laws that are mandated by the government to enforce and implement.

Educating the public is a challenging but fulfilling task. It needs persuasion with sincere intention not just because it is part of the job that needs to be accomplished but part of the advocacy as a person. Enforcement of a law needs a top-down and bottom-up approach and combined efforts from the central and local government and the public.

The state and officials in the government plays a very significant role in in initiating environmental related programs and activities in the community combined with their sincere strong political will to protect and conserve our environment. We have to follow rules not just because the law says it so, but we have to understand that we need the environment to sustain our lives more than the environment needs us. Citizen vigilance on environmental issues and participation on the decision-making process on these matters will bring a crucial germane approach in protecting our environment. But with the present status of our environment, the people should not wait for the Government what

is the proper thing to do or not to do, initiative should come to the people itself. We are all partners in the battle to fight climate change for we will all be winners if we win this fight, as well as our future generations.

In our present millennium age where technology plays a vital role of communication especially on the young adults uses social media as part of their daily routine life, information dissemination thru FB, IG, Twitter and other online machines can be utilized for a massive environmental awareness campaign. Utilizing other forms of media such as TV, Radio and print out materials can even more effective although more expensive than the social media. Nationwide campaign through the use of advertisement on Radios, online and printed Newspapers, Television and billboards on how to properly comply with the different environmental regulation should be initiated. The public should be taught on the positive and negative implications of every mindful and careless actions towards our environment. Inside and outside activities of schools and every institution should include first-hand experiences and participation on protecting nature as well as the enjoying the beauty of our planet can offer. Regulation and enforcement are interrelated but two different things and there should be tool to be utilized in order to attain the goal, implementing the laws and at the same attaining human and ecological and contributing to the country's sustainable development goal.

Utilizing training or awareness and active citizen participation are effective tools to reinforce policy implementation not only in environmental regulation but in all setting of laws. It can also help combat corruption and uplift image of the government for it encourages provision of quality public services. Environment is everyone's business, no exemption and no limitations. Every mankind, every human being wherever they may be located in this world, the waters we drink, the air we breathe and the beauty of nature we all enjoy were all provided by one Planet we live in. Let us do our own share and wait not for the government to act, everyone can effectively contribute to protect, preserve and conserve our environment as responsible stewards of this generation and the next.

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Abstract in Korean

필리핀의 환경규제와 대안적 시행 수단으로서의 환경 교육 활용

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우리의 환경은 천연 자원의 감소, 대기, 수질, 토양 폐기물을 비롯한 유해 폐기물 오염의 증가 등의 중대한 세계적인 문제에 직면해 있다. 산업 혁명, 과학의 발전과 기술의 혁신은 인류의 삶의 모든 측면을 극적으로 변화시켰으나, 이는 지구의 생태와 인류 환경과의 관계에 중요한 전환점이 되고 있음을 보여준다. 환경의 질은 천연 자원의 고갈과 함께 훼손되었고, 환경 훼손은 인류가 지구로부터의 천연 자원, 청정한 대기, 수질과 오염되지 않는 환경을 누리는 것을 저해하고 있다.

인류는 자연으로부터의 끔찍한 복수를 전세계에서 발생하는 수많은 재난을 통해 겪어왔다. 보고된 연구에 따르면 재앙적인 사건을 발생시키는 한 가지 요인은 환경 파괴를 야기시킨 인간의 활동이라고 언급하고 있다. 더욱이 기후 변화 이슈는 전 세계의 모든 나라에 영향을 미치고 있다. 지구 온난화와 더불어 현재 지구의 기후 패턴은 급격한 변화를 보이고 있는데, 극지방 빙하의 융해는 가속화되고 전 지구적인 해수면은 상승하고 있는 추세이다. 이러한 파괴적인 현상이 계속해서

방치되고 완화되지 않는다면, 인류는 이 행성의 뜨거운 열기 속에서 살아남을 수 없을 것이다.

앞으로의 환경 파괴를 방지하기 위해서는 국민들이 환경 관련 문제에 참여해야 할 필요성이 제기되고 있다. 환경 보호와 더불어 국민들의 복지에 상당한 영향을 줄 수 있는 주요 환경 관련 문제에 대해 대중들의 비판적인 사고 활용과 함께 중요 의사 결정 과정에의 참여가 요구되고 있는 실정이다.

본 연구는 필리핀에서의 효과적인 거버넌스를 위한 환경 규제 준수와 대안적 시행 수단으로서 활용될 수 있는 환경 교육에 대하여 두 방법 간의 상관관계를 정립하는 것을 목적으로 하였다. 상관관계의 검증은 정보의 확산과 전략적이고 응용된 프로그램을 통해 선정된 응답자들에게 환경 문제 참여의 권한을 줌으로써 이루어졌다. 이를 통해 양질의 인간 복지와 지속 가능한 생태계로의 법적 규제의 시행이 이루어질 수 있음을 증명하였다. 모든 시민의 환경 관련 문제의 참여는 제도적인 역량 부족에 직면해 있는 현재의 법적 수단을 보완할 수 있는 것으로 조사되었다. 따라서 환경 교육을 통한 국민들의 환경 문제 참여 증대는 현존하는 법적 프레임워크를 강화시킬 수 있을 뿐만 아니라 법 제도 시행의 확대에 기여할 수 있음을 보여주고 있다.

주제어: 환경규제, 환경교육, 기후변화, 전체적인 환경의식, 지속 가능한 생태계

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